[0034] According yet still further to the third aspect of the invention, all components of the general purpose input board may be made of materials substantially transparent in a visible part of an optical spectrum

[0035] Benefits of using the general purpose input board for the touch activation may include (but may not be limited to):

[0036] Passive switchcovers with different input device configurations can be used on one phone model;

[0037] The same UI board can be used on different phone models;

[0038] No need for wiring the switchcover and for electrical connections; the phone would just need a software setting/update to accept a switchcover with a new input device layout;

[0039] Keys, an analogue joystick and a touchpad are possible to use for the key mechanism;

[0040] Force-sensitive input devices are possible to use;

[0041] A rubber dome and a metal dome can be used for the key mechanism;

[0042] A touchpad implemented with the invention is insensitive to non-linearities of the top membrane resistance (e.g., when a membrane-like actuator is used);

[0043] The input board could be produced as a flex of one fairly large size, then cut to a proper size to fit a particular phone model.

BRIEF DESCRIPTION OF THE DRAWINGS

[0044] For a better understanding of the nature and objects of the present invention, reference is made to the following detailed description taken in conjunction with the following drawings, in which:

[0045] **FIG. 1** is a block diagram of an electronic device having a general purpose input board for providing an actuator identity signal indicative of a location of said actuator on a surface of said general purpose input board and optionally indicative of a force imposed by said actuator on said general purpose input board, according to an embodiment of the present invention;

[0046] **FIG. 2** is a perspective view of a general purpose input board, according to an embodiment of the present invention;

[0047] **FIGS. 3***a* is a cross-sectional view of a general purpose input board with an actuator utilizing a key (on the left) or joystick (on the right) as an input device, according to an embodiment of the present invention;

[0048] **FIGS. 3***b* is a cross-sectional view of a general purpose input board taken along **3***b* line in **FIG. 3***a*, according to an embodiment of the present invention;

[0049] **FIG. 4** is a schematic representation of a general purpose input board implemented as a printed input board, according to an embodiment of the present invention; and

[0050] **FIG. 5** is a block diagram of an electronic device having a transparent general purpose input board as a part of a touch display, according to an embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

[0051] A new apparatus and method are presented for a touch actuation in an electronic device (e.g., a wireless portable device, a mobile communication device, a mobile phone, etc.) using a general purpose input board.

[0052] According to an embodiment of the present invention, the general purpose input board (or alternatively called an input board) comprises of a grating of conductors running in one direction (y-lines). Between these conductors there are contacts connected to a grating running in the perpendicular direction a layer below (x-lines). The grating layers are separated by an insulating layer. The input board can be manufactured using a wide variety of technologies, e.g., printable resistive, conductive and insulating materials. Various known methods (discussed below) can be used to read the position of any, e.g., conductive actuator touching the input board. The input board can be used, e.g., as a configurable UI (user interface) board under a keymat. The input devices on the keymat can be of almost any type (a key, a joystick, a touchpad top membrane, etc.) and their configurations and positions can be freely varied on switchcovers. In addition, the actuators can be made force-sensitive by detecting a contact surface area.

[0053] There are many ways to implement the input board, including but not limited to:

[0054] Implementing conventionally on a printed wire board, as shown in **FIG. 3** and discussed below;

[0055] Implementing on a flexible conductor; and

[0056] Implementing by printing with conductive, resistive and insulating materials as shown in **FIG. 4** and discussed below.

[0057] **FIG. 1** shows a block diagram (representing one example among others) of an electronic device **22** having a general purpose input board **10** (or alternatively called an input board) for providing an actuator identity signal **32** indicative of a location of said actuator on a surface of the input board **10** and optionally indicative of a force imposed by said actuator on the input board **10**, according to an embodiment of the present invention.

[0058] A manipulation signal **16** is applied to an actuator **12** of the electronic device **22** by a user **26** to communicate a predetermined command to the electronic device **22**. The manipulation signal **16** can be, e.g., a mechanical touch of the user **26** using a stylus or a finger. According to an embodiment of the present invention, the actuator **12** can be made of a flexible conductive material attached to an insulating cover **11** such, that the manipulation signal **16** is applied to the flexible conducting material of the actuator **12** through the insulating cover **11**. The actuator **12**, having a "flexible" connection with a cover of the electronic device **22** can move in a direction **18** perpendicular to the surface of the input board **10** and possibly can move in a plane parallel (e.g., directions **20***a* and **20***b*) to a surface of the input board **10** of the electronic device **22** within a predetermined area of the input board **10** using said manipulation signal **16**.

[0059] If the actuator **12** makes a physical contact with the input board **10**, an actuator identity signal **32** is generated by the input board **10** for providing said predetermined com-